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ABSTRACT

This paper reports the results of an empirical study on the role of finances on college persistence. A quantitative causal model, that relied on several theoretical frameworks, was tested via structural equation modelling for categorical data that incorporated constructs from the financial aid literature as well as the persistence literature. The research design was longitudinal in nature and analyses were conducted on a sample of 466 college students who were attending a large public urban commuter institution in the spring of 1989. In sum, results appeared to suggest that financial aid is important, not only because it equalizes opportunities between affluent and low-income students, but also because it facilitates the integration of the student into both the academic and social components of the institution as well as influencing his or her commitment to stay in college. Contains 51 references. (Author/GLR)

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THE ROLE OF FINANCES IN THE PERSISTENCE PROCESS: A STRUCTURAL MODEL[1]

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ABSTRACT

The study empirically examined the role of finances on college persistence by presenting a causal model that relied on several theoretical frameworks. A quantitative model was tested via a Linear Structural Equations for categorical data that incorporated constructs from the financial aid literature as well as the persistence literature. The research design was longitudinal in nature and analyses were conducted upon a sample of 466 college students who were attending a large public urban commuter institution in the spring of 1989. In sum, results appear to suggest that financial aid, and its concomitant attitude, is important not only because it equalizes opportunities between affluent and low-income students, but also because it facilitates the integration of the student into the academic and social components of the institution as well as by influencing his or her commitment to stay in college.

The Role of Finances in the Persistence Process: A Structural Model.

Quantitative studies of college student persistence have followed two non-overlapping paths. The first approach has introduced organizational and sociological theories in an effort to clarify processes linking student related factors with institutional ones (Tinto, 1975, 1987; Bean, 1982; Bean & Metzner, 1985; Bean & Vesper, 1990). With few exceptions (Bean, 1982; Bean & Metzner, 1985; Bean & Vesper, 1990; Cabrera, et. al, 1990; Metzner & Bean, 1987), these theoretical perspectives and supporting research have typically failed to examine or to test the integrated role of financial factors in the persistence process (Cabrera, et. al, 1990). This omission is particularly critical given the substantial institutional, federal and state investment in financial assistance programs[2] (Lewis, 1989; Voorhees, 1985), and the corresponding interest on the part of policymakers and practitioners to know how and to what extent financial aid enhances persistence in college (Porter, 1991).

The other parallel line of research is represented by studies that rely mainly on price-response theories and on theories of targeted subsidies (e.g., Manski & Wise, 1983; St. John, 1990; St. John, Kishstein & Noell, 1991; Stampen & Cabrera, 1986, 1988). As pointed out by Nora and Horvath (1989) these studies mostly explore whether the reception of student aid or particular combinations of student aid packages bear a relationship with persistence or academic performance in college. Although this line of research has informed policymakers and institutional practitioners of: a) the overall, but singular,

effect of financial aid on persistence (e.g., Astin, 1975; Murdock, 1987; Stampen & Cabrera, 1986, 1988), b) how sensitive persistence decisions are to grants, loans and work study awards (e.g., Astin, 1975; Nora, 1990; St. John, 1990; St. John, Kishstein & Noell, 1991; Voorhees, 1985), and c) the effectiveness of particular student aid packages in the retention of minorities (e.g., Astin, 1975; Olivas, 1985; St. John, 1990), little information is provided as to what role financial aid plays in the total college persistence process itself (Cabrera, et. al, 1990). As noted by Voorhees (1985) and by Nora and Horvath (1989) most finance studies are impact-oriented. That is, they emphasize the effect of financial aid in persistence rather than the overall underlying structural patterns involving this variable with other factors. These impact-oriented studies typically include measures of precollege motivational factors, precollege academic ability and achievement, demographic factors, students' socioeconomic status and college performance in order to control for background or pre-college sources of variance when assessing whether financial aid or combinations of student aid packages increase persistence (St. John, 1990). Little attention has been paid to the underlying process linking these pre-college variables both with financial aid (Voorhees, 1985; Nora, 1990) and with intellectual and non-intellectual factors related to college experiences. In those few instances where a process is portrayed in quantitative models (Voorhees, 1985; Moline, 1987; Nora, 1990), research designs typically have not theoretically examined or tested the causal relationships among finance

factors, student characteristics and integration and commitment factors.

The purpose of this paper is to explore the role of finances in a college persistence model theoretically based on conceptual frameworks advanced by Tinto (1975, 1987), Bean (1982), Bean and associates (Bean & Metzner, 1985; Metzner & Bean, 1987; Bean & Vesper, 1990) and Cabrera et. al (1990). Specifically, the paper explores the direct and indirect effects of finances on persistence in the context of such important noneconomic variables as significant others' influence, precollege academic achievement, academic and social integration, goal and institutional commitments and intent to persist.

THEORETICAL FRAMEWORK

To date, the most widely tested theoretical model of student persistence is Tinto's (1975, 1987) student integration model. Tinto conceptualized persistence as a longitudinal process of interactions between the student and the academic and social components of the institution. The theory asserts that, other factors being equal, the academic and social components shape two underlying individual commitments: commitment to college completion and commitment to the institution itself. Accordingly, the stronger the goal commitment and/or the greater the level of institutional commitment, the greater the probability that a student will complete college.

The usefulness of the student integration model as a framework to explore the effect of finances on college persistence is limited. Although the student integration model

indicates that finances are important in shaping educational goals and in the selection of institutions, the theory is silent about the role of finances once students enroll. Apparently, the justification for this omission seems to rest on studies indicating that aided students show no higher propensities to persist than do non-aided students (cf. Tinto, 1987, pp. 80-81). However, the interpretation of this finding as constituting the lack of an effect of ability to pay on subsequent persistence behavior is incorrect. Recent research on student aid has shown that non-aided students come from higher family income backgrounds as compared to aided students, and that student aid is heavily targeted to students from low-income families (Jackson, 1988; Lewis, 1989; St. John, 1990; Stampen, 1985; Stampen & Cabrera, 1988). Moreover, these studies also indicated that student aid is effective in compensating for the disadvantage of low income by making low-income students as likely to persist as more affluent students (e.g., Leslie & Brinkman, 1988; Murdock, 1987; St. John, 1990; Stampen & Cabrera, 1986, 1988). Consequently, previous results as those cited by Tinto (1987) more accurately support the view that financial aid equalizes persistence rates among lower income aided students and more affluent non-aided students (Murdock, 1987; Nora & Horvath, 1989; Porter, 1991; Stampen & Cabrera, 1986).

Other researchers of student persistence (Bean, 1985; Bean & Vesper, 1990; Bean & Metzner, 1985; Metzner & Bean, 1987; Cabrera et. al, 1990) have advanced models in which the role of finances in the persistence process is regarded as extending to

motivational, social and academic integration factors. In these models, finances is comprised of two dimensions; an objective component, reflecting a student's availability of resources, and a subjective dimension, reflecting a student's perception of his/her difficulty to finance college-related expenses (Bean, 1982; Bean & Metzner, 1985; Bean & Vesper, 1990; Cabrera et. al, 1990). For Bean and his associates, finances not only impact students' withdrawal decisions directly, but extend indirectly through other variables. These intervening variables include academic factors, a student's socialization process, and such psychological outcomes as satisfaction with the institution, perceptions of fitting in or belonging at an institution (institutional fit), perceived utility of the education obtained from the institution, commitment to the goal of college completion itself and intent to persist. While relying on the student integration model (Tinto, 1975, 1987) as a theoretical basis for their study, Cabrera, Stampen and Hansen (1990) similarly argue that financial factors, while exerting a direct effect on persistence, can affect a student's academic and social integration process and his/her commitments to college completion and to the institution as well.

Empirical evidence has been found for the implicit role of finances in the persistence process in studies relying on the student integration model (Tinto, 1975, 1987) or the student attrition model (Bean, 1982). Bean (1985) reported that finances, a composite made up of attitudes and self-reported family income, exerted a significant effect on persistence while

having a small but significant effect on institutional fit for a sample of college freshmen at a major midwestern university. No significant effects of finances on other variables were found. Metzner and Bean (1987) found that finance attitudes had a small but significant effect on intent to persist among nontraditional students attending a midwestern urban institution. Based on a sample of freshmen from a midwestern college, Bean and Vesper (1990) reported that finance attitudes had a direct effect on institutional fit. Cabrera, Castañeda, Nora and Hengstler (in press), while validating the student attrition model, found a direct effect of satisfaction with financial support (finance attitudes) on students' satisfaction with their courseloads (courses), college academic performance (GPA) and persistence for a sample of college students enrolled at a southwestern urban institution.

Using the student integration model (Tinto, 1975, 1987) as their conceptual framework, Cabrera et. al (1990) found that SES, an objective indicator of a student's finances, exerted direct effects on decisions to persist for a national sample of college students attending four-year institutions. Moreover, they reported that finance attitudes slightly moderated the effect of goal commitment on the persistence criterion. However, no evidence was found to support the presumed effects of finances on academic integration and social integration, while the absence of indicators for institutional commitment prevented them from testing the effects of finances on this construct. Recently, Mallette and Cabrera (1991) reported that finance attitudes,

while controlling for the effects of academic integration, social integration, goal commitment and institutional commitment, discriminated between persisters and non-persisters among college freshmen attending North Carolina State University. On the other hand, Nora and Wedam (1991) found that the total number of hours worked by students, an indicator of the student financial condition, was directly related to student persistence for a sample of students at a large urban commuter institution.

Several limitations must be noted with studies attempting to analyze the effect of finances in the persistence process. These studies have traditionally collapsed finance attitude measures with objective indicators. This practice makes it difficult to ascertain the particular effect attributable to each finance component. In those rare circumstances in which the effects of each dimension are under study (Cabrera, et. al, 1990), researchers use SES as the proxy for availability of financial resources instead of relying on the awarding of student aid itself. Although SES is an indicator of ability to pay, SES incorporates other dimensions (i.e., family occupational status, parental educational attainment, degree of encouragement given to children to pursue college education) which makes it difficult to tease out the effect of finances from other components. Another limitation is the measurement of the constructs under study when national data bases are employed. As noted by Cabrera et. al (1990) testing the effects of finances based on theoretical driven models is restricted by the quality of the surrogates available in national data bases.

A Model of the Role of Finances on the Persistence Process

Figure 1 graphically displays the structural paths hypothesized in the present study. As a whole, the model draws from the student integration model (Tinto, 1975, 1987), the student attrition model (Bean, 1982, 1985; Bean & Metzner, 1985; Metzner & Bean, 1987; Bean & Vesper, 1987), the ability to pay model (Cabrera, et. al, 1990), Nora's models addressing the role of friends and parental influence on the persistence process (Nora, 1987; Nora, Attinasi & Matonak, 1990), Pascarella and associates' (Pascarella & Chapman, 1983; Pascarella, Duby & Iverson, 1983) findings on large urban commuter institutions, and research on financial aid (Voorhees, 1985; Nora, 1990). The model incorporates all variables that Tinto's student integration model defines as affecting persistence decisions while the student is enrolled in college. Accordingly, the model presumes that students' experiences with the academic and social components of the institution contribute to enhance their educational goals and their institutional commitments. In turn, these commitments are believed to affect their intent to persist. In adherence with Bean (1982) and Bean and Metzner's (1985) frameworks, the model hypothesizes that intent to persist leads to subsequent persistence decisions. This conceptualization is aligned with previous research. Several longitudinal studies (Bean, 1982, 1985; Bean & Vesper, 1990; Cabrera, et. al, in press; Pascarella & Terenzini, 1983; Pascarella, et. al, 1983) have found not only that a student's intent to persist, measured when the student is still enrolled in college, is highly

predictive of subsequent retention/attrition behavior, but also that commitments to the institution and to the goal of college completion are channeled through this variable.

Insert Figure 1 here.

Unlike previous verifications of the student integration model, the present structural model regards academic integration as comprised of two separate, yet intercorrelated dimensions, a cognitive component (or variable) consisting of the student's academic achievement, and a noncognitive component (or variable) reflecting the academic and intellectual development of the student (Tinto, 1975). The model presumes that only the cognitive component (GPA) of the construct, academic integration, exerts a direct effect on persistence decisions. Although previous findings (Pascarella, et. al, 1983; Pascarella & Chapman, 1983) on studies conducted at commuter institutions have found a direct effect between measures of academic integration and persistence, it is believed that the significant effect between the two variables may have been attributed more to the operationalization of the construct than to the true nature of the relationship. Pascarella and associates produced a single score by combining measures of academic and intellectual development with academic performance (GPA). This practice could have resulted in significant direct effects due more to the

presence of the cognitive component rather than to the noncognitive component of academic integration. Moreover, recent research based on confirmatory factor analysis has substantiated the poor fit of college academic performance as either a multiple indicator of academic integration or as part of a composite score (Nora, 1990; Cabrera et. al, in press). On the other hand, research on financial aid has also reported a significant direct effect between college academic performance and persistence (Voorhees, 1985; Nora, 1990).

Following propositions by Tinto (1987) and by Bean and Metzner (1985), the model also hypothesizes that compensatory (non- causal) relationships may exist between social integration and the noncognitive component of academic integration, and between institutional and goal commitments. Support for these compensatory relations has been found by Stage (1989) and Cabrera et. al (in press).

The model also hypothesizes that precollege academic performance exerts direct effects on academic integration. Tinto (1975) has suggested high school academic performance is a good predictor of the academic integration because it embraces abilities and motivations which allow the student to participate in the academic component of the institution. Research on financial aid supports this proposition. Nora (1990) and Voorhees (1985) reported that high school performance exerts a significant effect on college academic performance, while failing to have a direct effect on persistence.

The model also presumes that the extent to which students are encouraged by their families and friends to pursue a college education (significant other's influence) can affect students' academic and social integration, and their institutional and goal commitments. The role of significant other's influence in the persistence process is consistent with several college persistence models (Bean, 1985; Bean & Metzner, 1985; Bean & Vesper, 1990; Nora, 1987; Cabrera et. al, 1990), the occupational attainment literature (e.g. Sewell & Hauser, 1980), and with recent research. Research has found that significant others' influence is important in both the development of educational aspirations among high school students (Stage & Hossler, 1988) as well as on subsequent postsecondary social integration (Nora, 1987; Nora, Attinasi & Matonok, 1990; Nora & Rendon, 1990) and commitments to the institution (Bean, 1985; Cabrera et. al, in press).

With regards to finances, the model posits that this construct has a direct effect on persistence decisions while affecting students' social and intellectual experiences at the institution. Bean and Metzner (1985) and Cabrera et al. (1990) have argued that students' concerns with finances, along with other external factors to the institution, can affect their academic integration by increasing anxieties associated with the need of securing resources to finance their college education, and by limiting the amount of time and energy spent on academically-related activities. Support for these hypotheses is evidenced by recent research (Nora, 1990; Voorhees, 1985).

Voorhees (1985) found that unmet need, an objective indicator of finances, affected college academic performance, a variable that the student integration model (Tinto, 1975, 1987) regards as a manifestation of a student's academic integration. Nora (1990) found that both campus and non-campus student aid programs had direct effects on the student's academic achievement as well as on his or her persistence behavior. Nora and Wedam (1991) found that pull factors (total number of hours worked) exerted significant direct effects on persistence decisions.

The causal model presumes that finances can exert an effect upon social integration. Bean and Metzner (1985), and Cabrera et al. (1990) have argued that finances can affect social integration by removing or reducing students' barriers to full participation in the social component of the institution.

Moreover, the model assumes that finances exert direct effects on institutional and goal commitments. As suggested by Tinto (1975), Bean (1985), Bean and Metzner (1985) and Cabrera et al. (1990), students may be less likely to be committed to an institution or to the goal of securing a college degree to the extent to which concerns about the costs of attendance make alternatives such as full-time jobs and transferring to other institutions more appealing.

Finally, the model also considers a non-causal relationship between the reception of financial aid and precollege academic ability. As noticed by Stampen (1980, 1985), several state and institutional programs tie the reception of some student aid programs (i.e., scholarships) to demonstrated academic ability.

RESEARCH DESIGN

Sample

A longitudinal research design was used. The student population was drawn from the fall 1988 entering freshman class at a large commuter urban institution. In the study sample, 61 percent of the students lived in housing other than residence halls and 67 percent of the students had part-time jobs. These job-related and housing figures are representative of those reported by the institution (70 and 75 percent, respectively). Only full-time, first-time freshmen who were United States citizens, under twenty-four years of age and not married were selected. The number of freshmen meeting these criteria was 2,453.

In April of 1989, freshmen meeting these criteria were mailed a questionnaire containing 79 items. These items were selected from several instruments developed by Bean (1982, 1985), Metzner & Bean (1987), Pascarella and Terenzini (1980) and Nettles, Gosman, Theony & Dandridge (1985). The literature on organizational behavior was also consulted to derive additional items for institutional commitment (Mowday, Steers & Porter, 1979; Pierce & Dunham, 1987) and goal commitment (Dunham, 1984). In order to improve the content validity of the items, the original item's wording were reviewed and modified by institutional academic advisors and counselors. A pilot study was also conducted on a representative sample of undergraduate students to help in the refining of the items. An initial survey and a follow-up survey yielded 466 usable surveys. Student

college transcripts and institutional financial aid records were accessed to determine GPA at the end of the 1989 Spring semester and financial aid. Fall 1989 institutional transcripts were consulted to determine enrollment status at the beginning of the 1989 Fall semester.

Comparisons of characteristics between students responding to the questionnaire versus non-respondents indicated that the sample mirrored the target population in most factors. The sample slightly overrepresented the proportion of whites (63.9% versus 58.5%), slightly overrepresented the proportion of students that had graduated from the top 10th percentile of their high school class (38.8% versus 33%), slightly overrepresented the proportion of aided students (57.5% versus 51.0%), and slightly under-represented the spring attrition rate (15.5% versus 17%).

Measurement

Institutional Persistence (P). The dependent variable for the study was institutional persistence. The construct was categorical in nature. Students who re-enrolled in the Fall of 1989 were coded "1". Those students who voluntarily withdrew from the institution between the Spring 1989 and Fall 1989 period were coded "0".

Independent variables:

Intent to Persist (IP). A student's intent to re-enroll at the respective institution in the Fall 1989 semester while still enrolled in the Spring 1989 semester provided a measure of intent

to persist. The item was borrowed from Pascarella and Terenzini (1979,1980).

Institutional Commitment (IC). A composite score, averaged across eight items, was employed to measure the construct. Eight items were drawn from instruments developed by Pascarella and Terenzini (1980), Bean (1982, 1985), Bean and associates (Bean & Metzner, 1985; Bean & Vesper, 1990) and Mowday et. al (1979). These items assessed feelings of belonging at the institution, certainty and confidence of institutional choice, assessments regarding the importance of graduating from the institution, the practical value of the education obtained from the institution, and institutional prestige. The eight items were combined into a single scale after a series of exploratory and confirmatory factor analyses indicated the validation of a single factor. Further evidence supporting the use of a single scale has been found by Cabrera, Castañeda, Nora and Hengstler (in press) who demonstrated that measures of institutional commitment, institutional fit, practical value and institutional prestige [representing Bean's (1985) and Tinto's (1975, 1987) theoretical frameworks] converged as a measure of a single construct. The reliability of the scale (Cronbach's alpha) was .88 (See Table 1).

Insert Table 1 here.

Goal Commitment (GC). Two items assessing the importance of completing a college degree and the importance of completing a program of study were used to measure goal commitment. The first item was selected from Pascarella and Terenzini (1980) while the second was identified from the organizational behavior literature (Dunham, 1984). Both exploratory and confirmatory factor analyses revealed that these two items loaded on a single factor. The reliability of the scale (Cronbach's alpha) was .69 (See Table 1).

Academic Integration (AI). Two indicators were employed to measure the student's integration into his or her academic environment. The first was cumulative grade point average (GPA) at the end of the spring 1989 semester identified from institutional records. The second indicator was the Academic and Intellectual Development Scale (AID) developed by Pascarella and Terenzini (1980). A composite score, averaged across four items was employed in the computation of the scale. The reliability of the scale (Cronbach's alpha) was .72 (See Table 1).

Social Integration (SI). A measure of the degree of the student's integration into his or her social environment was provided by the Peer-Group Relations Scale (Pascarella & Terenzini, 1980). The reliability of the scale (Cronbach's alpha) was .85.

Precollege Academic Performance (HSQ). High school ranks, grouped into quartiles and identified from institutional records, provided a measure of the student's precollege academic achievement. Literature reviews by Bean and Metzner (1985), Pantages and Creedon (1978) and Tinto (1975), have consistently

reported that high school grade point average and high school ranks are better predictors of persistence vis a vis standardized test scores. Recent research on financial aid has also found high school rank and grades as valid predictors of college academic performance (Nora, 1990; Voorhees, 1985).

Significant Others' Influence (SO). A composite score, averaged across two items, was employed to measure encouragement and support from friends and family. These items assessed the extent to which students' perceived encouragement by significant others in securing a college degree. Research on college persistence has found that encouragement from significant others exerts significant effects on the persistence process (Nora, 1987; Nora, Attinasi, & Matonok, 1990; Nora & Rendon, 1990; Cabrera et. al, 1990). Exploratory and confirmatory factor analysis indicated that these items loaded as a single factor. The reliability of the scale (Cronbach's alpha) was .32 (See Table 1).

Finances (FI). The model views finances as comprised of two interrelated elements; an attitudinal component reflecting a student's satisfaction with financial support, and an objective component reflecting whether students received financial aid. The objective component of the construct was measured by a categorical variable, Financial Aid (FAID). Students who received financial aid during the Fall 1988-Spring 1989 academic period were coded "2". Students who did not receive financial aid were coded "1". As shown by Stampen (1985) and his associate (Stampen & Cabrera, 1988) most student aid awards are contingent upon demonstrated financial need. Since computations of

financial need take into account parental and student contributions as well as some measures of disposable income (Fitzgerald, 1991), it is logical to expect that the reception of financial awards constitutes a reliable measure of a student's availability of resources[3]. Finance attitude (FA) was measured via a single item reflecting satisfaction with the amount of financial support (grants, loans, family, jobs) received while enrolled in college (Nettles et. al, 1985). Mallette and Cabrera (1991) have found this scale to discriminate between persisters and dropouts.

All items were measured via a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Scale scores were based on averages across respective items. Table 1 displays summary statistics and reliabilities for each variable in the causal model.

Data Analysis

Structural equation modeling via LISREL VII (Joreskog & Sorbom, 1989) was employed to estimate the parameters associated to the structural and measurement models of the hypothesized relationships among the constructs. Although previous research has treated persistence (categorical in nature) as a continuous variable when testing Tinto's model of college persistence, it was decided to operationally define the persistence criterion as a dichotomous variable and employ PRELIS (Joreskog & Sorbom, 1989) to compute polyserial correlations. PRELIS enabled the estimation of the correct correlations among ordinal, continuous and categorical variables and provided an estimate of the

asymptotic covariance matrix under arbitrary non-normal distributions (Browne, 1982, 1984). Because polyserial correlations were used, the asymptotic covariance matrix provided by PRELIS was analyzed via a weighted least square (WLS) solution. The WLS method produces asymptotically correct standard errors and X2 values under non-normality when one or more of the observed variables are ordinal or categorical (see Joreskog & Sorbom, 1989).

RESULTS

Figure 2 displays the structural coefficients found to be significant in the study. Table 2 reports the WLS estimates in the structural model. The total coefficient of determination for the structural model was .455 (46%). The model further accounted for 47 percent of the variance observed in Persistence while explaining 25.5 percent of the variance observed in Intent to Persist. The Chi-square for the overall model was 18.14 (df=18; p =.447). The Goodness of Fit Index was .996, the Adjusted Goodness of Fit Index was .985 and the Root Mean Square Residual was .035. All measures of goodness fit for the quantitative model were found to be significant. Measures of the goodness of fit for the model were further supported by the stemleaf plot and the Q-plot of standardized residuals.

Insert Figure 2 here.

Insert Table 2 here.

Academic Integration

The first structural equation in the quantitative model examined the effects of financial aid, finance attitudes, support and encouragement from significant others, and high school academic performance on measures of academic integration. Only finance attitudes (τ=.245), significant others (τ=.147) and high school performance (τ=.166) exerted significant direct effects on academic and intellectual development. Although it was believed that the awarding of financial aid would have positive effects on the noncognitive component of academic integration, no support was found for this hypothesis. As previously stated, however, the attitudinal component of finances, satisfaction with financial support received, was found to exert a significant direct effect on the noncognitive component of academic integration. The most important variable affecting the academic and intellectual development of the student was satisfaction with financial support, followed by precollege academic performance and encouragement received from significant others.

The second structural equation examined the effects of precollege factors, finances, and support from significant others on college academic performance (GPA). Only significant others (τ=.058), high school performance (τ=.321) and financial aid (τ=.224) were found to have significant direct effects on GPA.

The strongest direct effect was found for precollege academic ability followed by financial aid and significant others.

Social Integration

The third structural equation tested the effect of finances and significant others on measures of social integration. Both financial aid and support from significant others were found to have significant direct effects on the students' socialization process (gammas=.188 and .119, respectively). No support was found for the presumed effect of finance attitudes on social integration.

Commitment Factors

The fourth structural equation in the model examined the effects of finances, significant others and academic and social integration factors on institutional commitment. One of the three exogenous variables, significant others (τ=.107) exerted a direct effect on students' commitments to their institution. Of the two integration factors, only social integration (β=.319) was found to have a significant direct effect on institutional commitments. The largest effect on measures of institutional commitment was exerted by social integration.

The fifth structural equation in the model examined the effects of finances, significant others, both academic and social integration factors on students' educational goal commitments. None of the exogenous variables, with the exception of significant others (τ=.281), were found to have any direct effects on levels of goal commitments. Only the noncognitive component of academic integration was found to have a direct

effect (ß=.207). The largest direct effect was exerted by significant others, followed by academic and intellectual development.

Intent to Persist

The sixth structural equation in the model examined the effect of finances and commitment factors on intent to persist. As hypothesized, commitments to the institution (ß=.308), completion of a college degree (ß=.185), and financial aid (τ=.224) were found to have significant direct effects on a student's intent to persist. The largest direct effect was exerted by commitments to the institution, followed by financial aid and goal commitments.

Persistence

The last structural equation in the model tested the effects finances, cumulative grade point average and intent to persist on actual persistence behavior. Both college academic performance (ß=.263) and intent to persist (ß=.595) were found to have direct effects on persistence decisions.

Non-Causal Relationships in the Structural Model

Exogenous Variables

The Phi coefficients provided support for the hypothesized non-causal relationships between financial aid and finance attitudes and between financial aid and high school performance. The structural correlation between financial aid and finance attitudes was .468. The correlation between financial aid and high school performance was .488.

Endogenous Variables

The structural model revealed that the noncognitive and cognitive components of academic integration are interrelated. The structural correlation between academic and intellectual development and college academic performance was .312. The model further revealed compensatory relationships between academic integration and social integration. The correlation between academic and intellectual development and social integration was .266. Although there is a relationship between Academic and Social Integration as noted in Tinto's (1975, 1987) theoretical framework, the relationship is not causal in nature. The two variables are related, but not causally.

Similarly, the hypothesized relationship between Institutional Commitment and Goal Commitment (Psi=.120) was also found significant. Again, while there is a definite relationship between the two variables in the structural model, the relationship is not one of causality.

Total Effects.

Table 3 reports the total effects for those paths found significant in the model. Without exception, all variables were found to have significant total effects on persistence (see Table 3). The largest total effect on persistence was exerted from Intent to Persist. The second largest total effect on persistence behavior was accounted by students' cumulative grade point average in college followed by financial aid, commitment to the institution, social integration, precollege academic performance, commitment to degree completion, support from

significant others, academic and intellectual development, and finance attitudes.

Insert Table 3 here.

DISCUSSION AND CONCLUSIONS

Public assistance to students grew from $546 million in the 1963-64 academic period to $26.7 billion in the 1989-90 academic period (Lewis, 1989). This assistance went primarily to financially needy students. In the 1983-84 academic period, for instance, public colleges and universities awarded 89 percent of their total student aid dollars on the basis of demonstrated economic need (Stampen, 1985). In view of the magnitude of the investment and the manner in which it is targeted, the role of student aid on facilitating persistence in college constitutes a major policy question (Cabrera, Stampen & Hansen, 1990).

As noted by Porter (1991), studies on financial aid have either focused on the effectiveness of particular aid packages in promoting persistence (e.g. Manski & Wise, 1983; Nora, 1990; Olivas, 1985; St. John, 1990; St. John, Kirshstein & Noell, 1991; Voorhees, 1985) or have examined the extent to which financial aid equalizes educational opportunities by eliminating the effects of income differences (e.g. Murdock, 1987; Stampen & Cabrera, 1986, 1988). Although these studies have contributed in understanding the role of financial aid in equalizing educational opportunities and in understanding the relative effectiveness of

student aid programs and their packaging on persistence, little effort has been placed on understanding what role, if any, financial aid has in the college persistence process together with a student's motivational and ability factors along with his or her institutional experiences (Cabrera, Stampen & Hansen, 1990).

Building on sociological and organizational theories, a second competing explanation to college persistence has evolved during the last ten years. Persistence theories and related research have not only documented the effects of academic ability, motivational and institutional factors on college persistence but have accounted for the complex process among these variables and their interplay across time (e.g. Pascarella et al., 1983; Pascarella & Chapman, 1983; Bean, 1982, 1985; Metzner & Bean, 1987).

Although these two lines of research have documented the role of financial and organizational/sociological factors affecting student persistence, they have not converged into a single integrated effort. The present study attempted to merge both approaches by analyzing the role of both the tangible and intangible elements of finances in the persistence process within the context of a theoretical framework. In this context, the study addressed a highly important policy research question; what are the effects of student finances on college persistence when academic ability, motivational, and integration and commitment variables (as well as their underlying structural patterns), are simultaneously taken into account? Unlike other studies that

employed only finance attitudes (Metzner & Bean, 1987; Mallette & Cabrera, 1991) or financial aid (Nora, 1990; Voorhees, 1985), this study not only takes into account the actual awarding of financial aid (which underscores an objective assessment of the availability of resources), but also incorporates attitudes that reflect students' assessments of the extent to which financial needs are being met not only from financial aid, but from other sources as well (i.e. family, jobs, friends). Thus, it presents a more comprehensive perspective of student finances within the persistence process.

The results of the study not only paralleled the findings in previous research on college persistence in commuter institutions (Pascarella et. al, 1983; Pascarella & Chapman, 1983) in that it validated the presence of a structure consistent with the theoretical framework, but the study also replicated and expanded on previous financial aid studies (Nora, 1990; Voorhees, 1985). Although both tangible and intangible components of finances were found to be intertwined, each had differential effects. While no direct effects on persistence by these two components were noted in the causal model, the findings do point out that financial aid has a significant total effect (through intervening variables) on persistence. The results specifically underline the indirect nature of finances in the persistence process in that it affects the student's academic integration, socialization processes, as well as his or her resolve to persist in college.

The findings indicate that having received some form of financial aid was found to facilitate the student's social

interactions with other undergraduates at his or her institution. It is believed that students who have received a financial aid award need not secure employment or, if already employed, spend additional time and effort in their present jobs. In other words, financial aid may provide recipients with enough freedom to engage in social activities and to become fully integrated into the social realm of the institution. Moreover, removing anxieties, time and effort associated with securing additional funds to finance their education, student aid recipients may have not only found it easier to interact with peers and participate in campus activities but may have also found it easier to engage in academic activities which enhanced their academic performance (GPA).

Hossler (1984) and Stampen and Cabrera (1986, 1988) have argued that academic and social integration may be particularly high among recipients or work-study programs because it exposes the recipient to faculty, academic staff and to institutional practices and policies. Olivas (1985) and Nora and Horvath (1990) add that work-study programs may be particularly effective in motivating students to budget resources and acquire skills relevant to their academic work. It is believed that the reception of financial aid in the form of scholarships may have been viewed by the recipient as a form of recognition of his or her performance; thus, this financial support may have motivated the recipient to maintain a high level of academic performance. The significant effect of financial aid on the student's intent to persist may underscore two factors associated with financial

aid. On the one hand, financial aid may have reduced the student's burden of meeting financial costs associated with attending college, therefore, decreasing the attractiveness of alternative activities such as transferring to another institution or entering into the labor force. On the other hand, the student may have viewed the institution as instrumental in securing future financial aid funds and, thereby, increasing a student's commitment toward maintaining membership at his or her institution.

The intangible component (or the student's satisfaction with having receiving financial support from his or her institution and from family) was found to affect his or her academic and intellectual development. As is the case in receiving financial aid, satisfaction with overall financial support may reduce concerns about finances allowing the student to allocate more energies and efforts to academic and intellectual endeavors related to classroom behaviors and academically-oriented interactions with faculty. In sum, results appear to suggest that financial aid, and its concomitant attitude, is important not only because it equalizes opportunities between affluent and low-income students (Murdock, 1987; Stampen & Cabrera, 1986, 1988; St. John, 1990), but also because it facilitates the integration of the student into the academic and social components of the institution as well as by influencing his or her commitment to stay in college.

The results of this study inform policymakers about the role of finances in the persistence process. Financial aid appears to

do what it was intended to accomplish, that is, to facilitate both the academic and social participation (involvement) of students in college, two factors that have been found to impact the student's decision to remain in college or to drop out. Results further suggest that when policy analysts evaluate the effectiveness of student aid programs, they should take into account the fact that the effects of finances take place within a context in which intellectual, academic, socialization and motivational factors interplay in shaping persistence decisions. While financial aid per se is not enough (Porter, 1991; Nora & Horvath, 1989; Cabrera et. al, 1990; Murdock, 1987) to influence persistence decisions (specifically in view of the lack of direct effects from any tangible and intangible aspects of finances), the indirect nature of the influence of finances on other academic and social facets of the student's education must be kept in mind by policymakers and institutional administrators. The findings of the present study suggest that intervention strategies and financial aid policies should consider the holistic nature of student finances in the persistence-related decision-making of students in higher education.

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FOOTNOTES

1. The authors would like to thank the editor and two anonymous reviewers whose comments helped to focus the manuscript as it relates to finances.

2. According to Lewis (1989), $26.7 billion dollars were allocated to financial aid from federal, state and institutional sources for the 1988-89 academic year.

3. This observation also holds in the sample under study. Based on self-reported annual family incomes in a scale ranging from 1 (less than $6,000) to 14 ($150,000 or more), results indicated that non-aided students had significantly higher average family incomes [x=9 ($40,000-$49,999)] as compared to that of aided students [x=7 ($30,000-$34,999)]; t-test = 7.47, p<.000].

Table 1. Descriptive Statistics and Marginal Distributions

Variables		Count	Cell %	Mean	S.D.	Cronbach's Alpha
Dependent Variable:						
Non-Persisters		72	15.5	-	-	-
Persisters		394	84.5	-	-	-
Independent Variables:						
Intent to Persist (IP)		466	-	4.44	1.01	-
Institutional Commitment	(IC)	477	-	3.44	.73	.88
Goal Commitment	(GC)	458	-	4.64	.54	.69
Academic Integration (AI)						
GPA		456	-	2.54	.77	-
Academic & Intellectual Development	(AID)	449	-	3.37	.71	.72
Social Integration	(SI)	455	-	3.52	.87	.85
Significant Others' Influence	(SO)	459	-	4.34	.66	.32
Precollege Academic Performance (HSQ)						
Top 10		157	38.8	-	-	-
Top quartile		155	38.3	-	-	-
Second top		76	18.8	-	-	-
First bottom		17	4.2	-	-	-
Finances						
Financial Aid	(FAID)					
Aided		268	57.5	-	-	-
Non-aided		198	42.5	-	-	-
Finance attitude	(FA)	459	-	3.09	1.31	-

Table 2. Standardized parameter estimates (WLS) for the model

	Dependent Variables						
Independent Variables	AID	GPA	SI	IC	GC	IP	P
FAID	-0.108	0.224*	0.188**	0.003	0.091	0.178**	0.027
FA	0.245**	0.031	0.019	0.152	-0.044	0.091	-0.002
SO	0.147**	0.058**	0.119**	0.107**	0.281**	-	-
HSQ	0.164*	0.321**	-	-	-	-	-
AID	-	-	-	0.229	0.207**	-	-
GPA	-	-	-	0.031	-0.017	-	0.263**
SI	-	-	-	0.319**	0.045	-	-
IC	-	-	-	-	-	0.308**	-
GC	-	-	-	-	-	0.185**	-
IP	-	-	-	-	-	-	0.595**
R^2	0.078	0.234	0.053	0.271	0.153	0.255	0.470

* $p < .07$; ** $p < .05$ one-tailed

Table 3. Total Effects on Persistence by:

	Total Effect	SE	t-value
Financial Aid	0.268	0.045	5.95
Finance Attitude	0.005	0.002	2.50
Significant Others	0.090	0.022	4.09
HSQ	0.085	0.034	2.50
Academic & Int. Dev.	0.030	0.011	2.72
GPA	0.271	0.096	2.82
Social Integration	0.140	0.046	3.04
Inst. Commitment	0.173	0.055	3.14
Goal Commitment	0.129	0.045	2.86
Intent to Persist	0.599	0.078	7.67

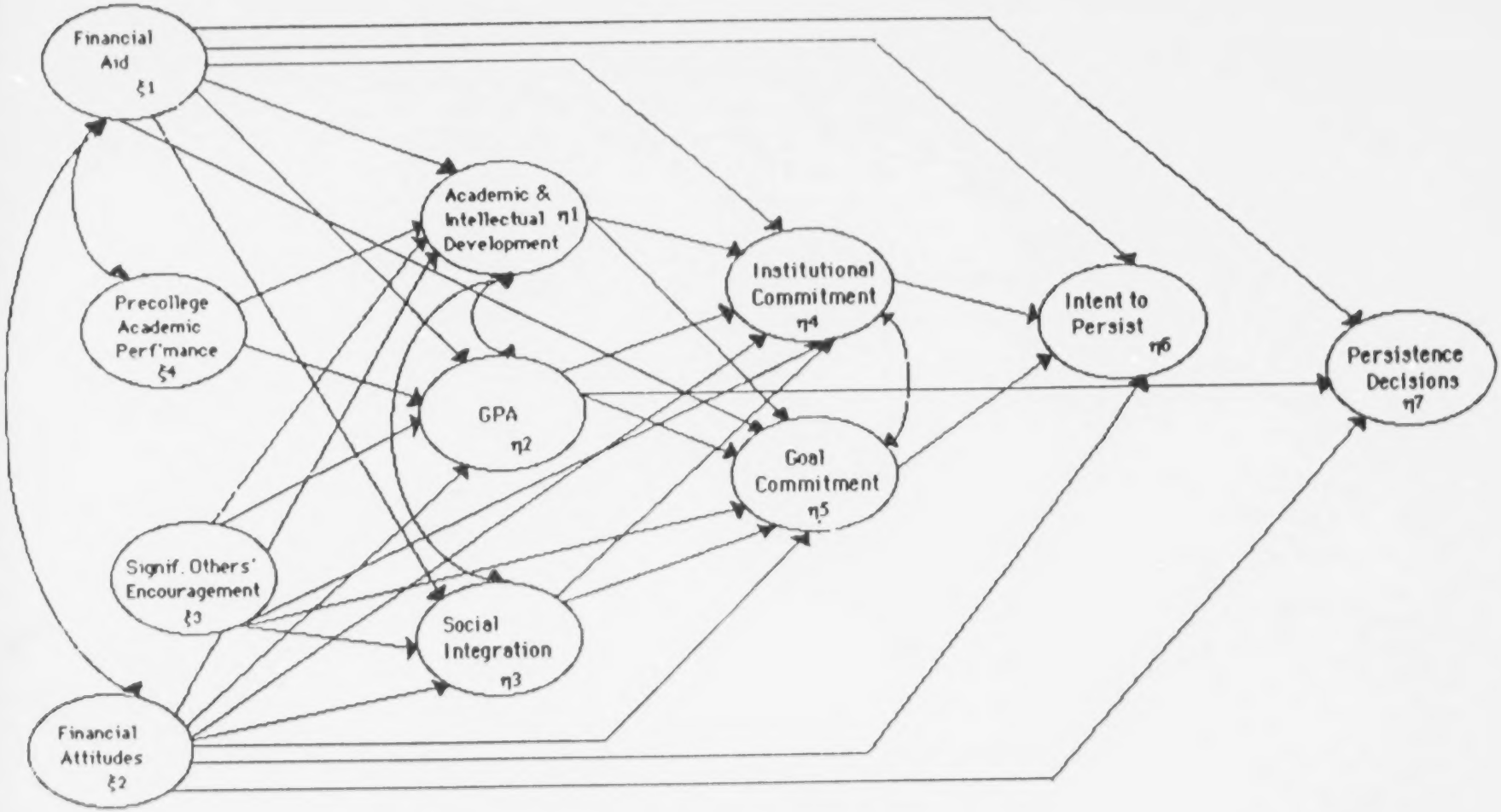

Figure 1 Full Structural Model

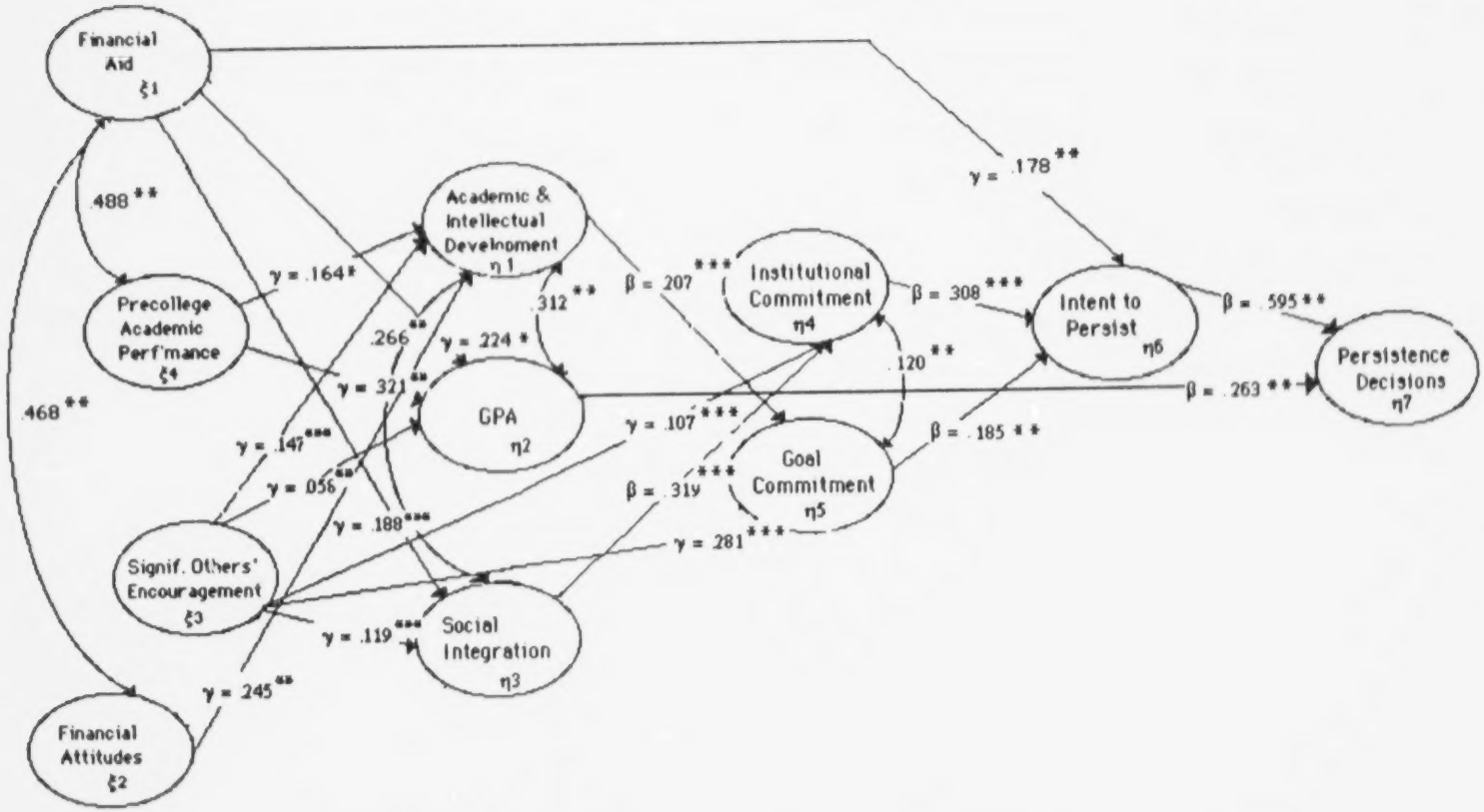

Figure 2 **Full Statistical Model**

* p < .01 ** p < .05 ***p < .01 one-tailed